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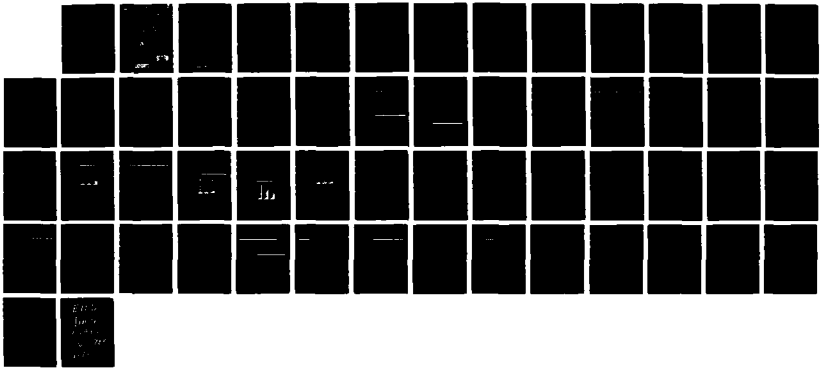
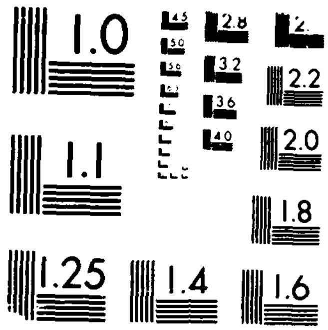




MICROCOPY RESOLUTION TEST CHART

United States General Accounting Office

GAO

Report to the Secretary of Health and Human Services

April 1988

MEDICARE

Refinement of Diagnosis Related Groups Needed to Insure Payment Equity

GAO/HRD-88-41

GAO United States
General Accounting Office
Washington, D.C. 20548

Human Resources Division

B-230528

April 22, 1988

The Honorable Otis R. Bowen, M.D.
The Secretary of Health and Human Services

Dear Mr. Secretary:

Because of the importance of diagnosis related groups (DRGs) to the Medicare prospective payment system, we evaluated the DRG case classification system as a means of grouping patients for payment purposes. This report presents the results of our study and contains recommendations to you.

As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to your Inspector General, the Administrator of the Health Care Financing Administration, and other interested parties.

Sincerely yours,

Lawrence H. Thompson

Lawrence H. Thompson
Assistant Comptroller General

Executive Summary

Purpose

In fiscal year 1986, Medicare paid hospitals about $45.6 billion for inpatient hospital services. About $35 billion was paid under the Medicare prospective payment system (PPS). PPS pays hospitals a fixed, predetermined amount for each Medicare beneficiary discharged from a hospital. The amount of the payment for a beneficiary depends upon the diagnosis related group (DRG) that the patient is classified under. Each DRG is composed of a set of diagnoses that are expected to require about the same level of hospital resources to treat. The PPS payment rate for a DRG is based on the national average cost of treating patients falling under the DRG. Therefore, PPS gives hospitals incentives for efficient operations because whether they profit or lose depends on whether their costs are below the national average cost.

For PPS to work as intended—that is, to encourage hospitals to operate efficiently while providing quality care—it is essential that DRGs group patients with similar resource needs. Hospitals then receive comparable amounts for treating like cases and have incentives to operate efficiently. Because of the importance of DRGs to PPS, GAO evaluated the DRG case classification system as a means of grouping patients for payment purposes. Specifically, GAO's objectives were to (1) measure the variations in the level of resources required to treat patients within the DRGs, (2) determine if hospitals get an equal mix of high- and low-cost patients in DRGs where a wide variation in resource requirements exists, and (3) determine if hospital characteristics, such as bed size and rural or urban location, are systematically related to whether a hospital receives patients with higher- or lower-than-average treatment costs within the DRGs.

Background

Under PPS, Medicare discharges are assigned for payment purposes to 1 of 473 DRGs based on the patient's principal diagnosis or the primary procedure performed. The PPS payments cover hospital operating costs—routine, ancillary, and intensive care inpatient services.

When PPS was developed, it was recognized that there would be some variation in the treatment costs among patients falling under a DRG. That is, there could be variations in treatment costs among the different diagnoses/procedures in a given DRG, as well as among individual patients with the same diagnosis. But it was expected that hospitals would treat enough patients so that losses on high-cost patients would be offset by profits from low-cost patients and that overall an efficient hospital would recover at least its full costs of treating Medicare patients.

The Health Care Financing Administration (HCFA), within the Department of Health and Human Services (HHS), is responsible for periodically reviewing the DRG classification system and making necessary adjustments.

To evaluate the DRG case classification system, GAO used information on 7.2 million Medicare patients discharged in fiscal year 1985. GAO used data from the cost reports of the 4,973 hospitals treating these patients to develop national average costs for each of the diagnoses/procedures included in the 406 DRGs that had at least 100 discharges classified under them. GAO used the national average diagnoses/procedure costs to compute each hospital's "expected cost" for a DRG or groups of DRGs.

Results in Brief

GAO found that one of the primary concepts behind PPS—that DRGs group patients whose treatment is expected to use about the same amount of hospital resources—was not being achieved. Rather, the variation of expected treatment costs for the diagnoses and procedures falling under certain DRGs was high. Moreover, high and low expected treatment cost cases were not evenly distributed among hospitals—603 hospitals, primarily medium and large urban hospitals, consistently treated patients with diagnoses/procedures in the high expected treatment cost range of these wide-variation DRGs, and 2,202 hospitals, mainly small urban and small rural hospitals, consistently treated patients in the low expected treatment cost range.

Two consequences arise from the combination of wide variation in treatment costs within DRGs and the uneven distribution among hospitals of low and high expected treatment cost cases. First, hospitals are paid the same amount for all patients falling under a DRG. Therefore, hospitals profit or lose on the wide-variation DRGs based more on the mix of patients they treat than on the efficiency of their operations. This is contrary to the basic premise of PPS that hospitals should be rewarded for efficiency. Second, wide variations in treatment costs within DRGs give hospitals financial incentives to seek patients with diagnoses in the low expected treatment cost range and avoid those at the high end. This, in turn, could adversely affect access to care for patients with high expected treatment costs and/or result in financial burdens from inequitable PPS payments for hospitals that do treat such patients.

Principal Findings

Wide Variations in DRG Resource Use Exist and Hospitals Do Not Get an Even Mix of Cases

The PPS payment rate for a DRG is based on the average cost of treating all patients falling under that DRG. In theory, DRGS were designed to group cases with diagnoses and procedures that take about the same amount of resources to treat. To determine how much variation in treatment costs exists within DRGS, GAO used a standard statistical technique that compares the average cost under a DRG to the actual cost of each case in the DRG. This analysis showed that there was a high degree of variation in 148 DRGS.

To determine if the wide variations identified adversely affected the equity of payments to hospitals, GAO analyzed whether hospitals received a mix of high- and low-cost patients within DRGS so that their costs approximate the average for the DRG.

GAO developed an index for each hospital that measured the hospital's expected cost per case relative to the national average cost per case in the 148 DRGS with the widest variation in treatment costs. Using this index, GAO found that 603 hospitals treated patients who on average had treatments costs that were expected to be from about 5 to 50 percent higher than the national average cost for the wide-variation DRGS. For example, at one of these hospitals, 100 of the 112 patients treated in one of the wide-variation DRGS had expected treatment costs that were higher than the national average treatment cost for the DRG—a total difference of about $242,000 above the national average cost for the DRG.

Likewise, 2,202 hospitals treated patients who on average had treatment costs that were expected to be from about 5 to 60 percent lower than the national average cost for the wide-variation DRGS. For example, at one of these hospitals, 92 of the 93 patients treated in one of the wide-variation DRGS had expected treatment costs that were lower than the national average treatment cost for the DRG—a total difference of about $137,000 below the national average cost for the DRG.

Types of Hospitals With High- and Low-Cost Patients

GAO's analysis showed that all types of hospitals treated patients with lower-than-average treatment costs within the wide-variation DRGS, and all types treated patients with higher-than-average treatment costs within those DRGS. However, about 53 percent of the urban hospitals with fewer than 100 beds and about 72 percent of the rural hospitals

with fewer than 100 beds received patients who had expected treatment costs that were lower than the national average cost for the wide-variation DRGS. The distribution of patients with expected treatment costs that were higher than average was less concentrated, but the larger urban hospitals were more likely to receive such patients than were any other hospital type.

Options Available to Reduce DRG Variations

GAO believes that, overall, the DRG case classification system provides a good basis for determining hospital payments under PPS. However, adjustments to the system are needed to reduce the amount of variation in resource requirements within many DRGS. This can be accomplished by creating new DRGS for those diagnoses or procedures that vary significantly in resource requirements from the other diagnoses and procedures within an existing DRG. Restructuring existing DRGS by reclassifying selected diagnoses or procedures from one DRG to another would also reduce variations within the DRGS. HCFA has used both of these methods to reduce such variations in the past.

Recommendations

GAO recommends that the Secretary of HHS direct the Administrator of HCFA to review those DRGS that GAO identified as having wide variations in patient resource requirements and to change the DRG classification system to reduce the variations within these DRGS.

Agency Comments

HHS cited its statutory obligation to review and adjust the DRG classifications annually, along with its past efforts to reduce variations within DRGS, as evidence that it was already meeting the spirit of the GAO recommendation. HHS stated, therefore, that additional actions were unnecessary.

GAO recognized HHS's statutory obligation (see p. 11) and the past HHS changes to the DRG classifications (see p. 37). However, the GAO analysis shows that, notwithstanding the HHS review activities, excessive variations in treatment costs can still be found in about one-third of the DRGS. GAO believes that HHS should reconsider its position and, as part of its required review of the DRG classification system, focus on the wide-variation DRGS that GAO has identified.

Contents

Executive Summary		2
Chapter 1 Introduction		8
	Background	9
	Prospective Payment System	9
	DRG Review Responsibilities	11
	Objectives, Scope, and Methodology	12
Chapter 2 DRGs—Wide Variations in Resource Requirements Affect Payment Equity		15
	Patient Resource Requirements Vary Widely Within Many DRGs	15
	Hospitals Do Not Have an Equal Mix of High- and Low-Cost Cases	17
	Conclusions	32
Chapter 3 Options Available to Reduce DRG Variations		33
	Creating Additional DRGs	33
	Restructuring Existing DRGs	34
	Conclusions	36
	Recommendations	36
	Agency Comments and Our Evaluation	36
Appendixes	Appendix I: DRGs With Coefficients of Variation Greater Than 90 Percent	40
	Appendix II: Data Tables	44
	Appendix III: Examples of Major Changes to the DRG Classification System (Fiscal Years 1985-87)	46
	Appendix IV: Comments From the Department of Health and Human Services	48
Tables	Table 2.1: Coefficient of Variation for DRGs Reviewed	16
	Table 2.2: Example of Difference in Computation of HCFA's CMI and GAO Index	22
	Table 2.3: Three Groups of DRGs Analyzed	22
	Table 2.4: Hospital Indexes for 148 Wide-Variation DRGs	23
	Table 2.5: One Hospital's Expected Costs and Payments for Patients Treated in DRG 12	25
	Table 2.6: One Hospital's Expected Costs and Payments for Patients Treated in DRG 461	28

Table 3.1: Comparison of Selected DRG 442 Procedure Charges to Average DRG Charges 35
Table II.1: Relationship Between GAO Index and CMI for Hospitals With GAO Index Greater Than 1.05 44
Table II.2: Relationship Between GAO Index and CMI for Hospitals With GAO Index Less Than 0.95 44
Table II.3: Range of GAO Indexes by Hospital Location and Bed Size 45

Figures

Figure 2.1: Expected Normal Distribution of Procedure Charges for DRG 39 and DRG 442 (Fiscal Year 1985) 18
Figure 2.2: Expected Normal Distribution of Procedure Charges for DRG 442, Nationally, and for Hospital "A" (Fiscal Year 1985) 19
Figure 2.3: Relationship Between DRG Variation and Reimbursement for Hospitals With Higher-Than-Average Expected Costs (Fiscal Year 1985) 27
Figure 2.4: Relationship Between DRG Variation and Reimbursement for Hospitals With Lower-Than-Average Expected Costs (Fiscal Year 1985) 29
Figure 2.5: Location and Bed Size of Hospitals With Lower-Than-Average Expected Costs in Wide-Variation DRGs (Fiscal Year 1985) 30
Figure 2.6: Location and Bed Size of Hospitals With Higher-Than-Average Expected Costs in Wide-Variation DRGs (Fiscal Year 1985) 31

Abbreviations

CMI	case-mix index
DRG	diagnosis related group
GAO	General Accounting Office
HCFA	Health Care Financing Administration
HHS	Department of Health and Human Services
ICD-9-CM	International Classification of Diseases, 9th Edition, Clinical Modification
PPS	prospective payment system
ProPAC	Prospective Payment Assessment Commission

Introduction

In 1983, the Congress enacted a prospective payment system (PPS), under which Medicare pays a fixed, predetermined amount for inpatient hospital services for each patient. The amount of the payment depends on the patient's diagnosis. A primary reason for establishing PPS was to give hospitals financial incentives to furnish services more efficiently. While the former cost reimbursement system did have cost-containment features, it was generally accepted that these features, at best, provided weak incentives for efficiency. Under PPS, hospitals know in advance what they will be paid and that they will gain a profit or suffer a loss depending on whether they can keep costs below PPS payments. Thus, hospitals have strong incentives for efficiency.

In establishing PPS, the Congress recognized that the financial incentives could result in adverse effects on quality of and access to care for Medicare beneficiaries. The Congress, therefore, built into PPS a number of safeguards, such as medical review of the appropriateness and quality of hospital services and the periodic review of the key elements of the system to assure that PPS kept up with changes in medical practice and costs.

One of the key elements to be reviewed periodically is the classification system that groups cases for payment purposes. Under PPS each Medicare discharge is assigned to a group—called a diagnosis related group (DRG)—based on the principal diagnosis of, sometimes in combination with the primary procedure performed for, the patient. Each DRG is supposed to be composed of diagnoses (and procedures) that are expected to consume about the same amount of treatment resources. The payment rate for a DRG is based on the national average cost of treating all Medicare patients falling under that DRG.

Because of the importance of DRGs to PPS, the Congress directed the Department of Health and Human Services (HHS) to periodically evaluate DRGs to assure they accurately reflect current medical practice and relative costs. We evaluated the DRG case classification system as a means of grouping patients for payment purposes, and this report presents the results of our evaluation. Specifically, it addresses the issue of variations in patient treatment resource requirements within DRGs and the effect of such variations on the equity of Medicare payments to hospitals.

Background

Medicare is a health insurance program that covers most Americans who are age 65 and over and certain individuals under 65 who are disabled or have chronic kidney disease. The program, authorized under title XVIII of the Social Security Act, provides coverage under two parts.

- Part A, Hospital Insurance, which is financed primarily by Social Security payroll taxes, covers inpatient hospital services, posthospital care in skilled nursing facilities, hospice care, and care provided in patients' homes. In fiscal year 1986, Medicare part A covered 30.9 million enrollees, and benefits amounted to about $48.9 billion. About $45.6 billion (or 93 percent) of the part A expenditures were for inpatient hospital services.
- Part B, Supplementary Medical Insurance, which is a voluntary program financed by enrollee premiums (25 percent of total costs) and federal general revenues, covers physician services and a variety of other health care services, such as laboratory and outpatient hospital services. In fiscal year 1986, Medicare part B covered 30.4 million enrollees, and benefits totaled about $25.9 billion.

Overall responsibility for administering Medicare lies with HHS. Within HHS, the Health Care Financing Administration (HCFA) develops program policies, sets standards, and is responsible for ensuring compliance with federal Medicare legislation and regulations. HCFA contracts with insurance companies, called intermediaries under part A and carriers under part B, to process and pay claims for covered Medicare services.

Prospective Payment System

From its beginning on July 1, 1966, the Medicare program paid hospitals retrospectively for their reasonable costs of providing covered services to beneficiaries. However, concerned about growing health care costs, the Congress established a Medicare PPS for hospitals in the Social Security Amendments of 1983 (Public Law 98-21). In contrast to the cost reimbursement system that it replaced, PPS established predetermined payment rates for hospital services. PPS covers hospital operating costs—routine, ancillary, and intensive care inpatient services.[1]

Under PPS the amount a hospital receives for its operating costs is determined by the DRG into which the patient is classified. Each DRG is a set of diagnoses and/or procedures coded in accordance with the International

[1]Capital costs, direct medical education costs, and outpatient costs continue to be paid on a reasonable cost basis. Also, psychiatric, children's, rehabilitation, and long term care hospitals or hospital units are exempted from PPS and continue to receive reasonable cost reimbursement.

Classification of Diseases, 9th Edition, Clinical Modification (ICD-9-CM). Currently, there are 473 DRGs, which are of two basic types—surgical and medical. Surgical DRGs are those in which an operating room procedure is performed. Patients are classified into the surgical DRGs based on their principal diagnosis and the primary operating room procedure performed. Medical DRGs are those requiring no operating room procedure, and patients are classified into these DRGs based on their principal diagnosis.

A hospital receives payment for treating a Medicare patient by preparing a Medicare claim and forwarding it to the intermediary. The claim includes the ICD-9-CM codes for the patient's principal diagnosis, secondary diagnoses, and any operating room procedures performed. Based on these codes, the patient is classified into a DRG.

Two factors determine the hospital payment—the "weight" of the DRG into which the patient was classified and the standard payment amount for the discharging hospital. The weight for a given DRG represents the national average resources required to care for Medicare patients in that DRG relative to the national average resources required to treat all Medicare patients. Thus, a patient in a DRG with a weight of 2.0 is expected to require about twice the amount of hospital resources to treat as an average Medicare patient. The DRG rate is multiplied by the discharging hospital's standard payment amount, which is the national average cost of treating a Medicare patient adjusted to reflect wage rates in the hospital's area and whether it is located in an urban or rural area. The PPS payment determined in this manner is adjusted upward for teaching hospitals and for hospitals that treat a disproportionate share of low-income patients.

The PPS payment process can be illustrated by a Medicare patient who is discharged from a hospital after being treated for viral pneumonia without having any complicating conditions. The hospital's claim for this patient could show an ICD-9-CM diagnosis code 4809, and based on this code, the patient would be classified into DRG 90 with other simple pneumonia and pleurisy cases. If the discharging hospital's standard payment amount were $3,000, this amount would be multiplied by the weight for DRG 90—0.8961 in fiscal year 1988—to arrive at a payment of $2,688.30. If the patient had a complicating condition such as diabetes (and therefore was more costly to treat on average), the discharge would be classified into DRG 89—simple pneumonia and pleurisy cases with complicating conditions. DRG 89 has a higher weight—1.2862 in fiscal year 1988—and the hospital would be paid $3,858.60.

When PPS was developed, it was recognized that there would be variations in the treatment costs among patients falling under a DRG. That is, there could be variations in treatment costs among the different diagnoses and/or procedures in a given DRG, as well as among individual patients with the same diagnosis within a given DRG. It was expected, however, that hospitals would treat enough patients so that overall, across all DRGs, losses on high-cost patients would be offset by profits on low-cost ones and that an efficient hospital would recover at least its full costs of treating Medicare patients.

However, if there are wide variations in resource utilization for different diagnoses/procedures in a DRG and if hospitals do not receive an equal distribution of patients with above- and below-average resource requirements within that DRG, hospitals can profit or lose regardless of their level of efficiency.

DRG Review Responsibilities

In establishing PPS, the Congress recognized that, because of changing medical technology, refinements to the DRGs would be necessary to ensure that they continue to group patients with similar medical conditions and resource requirements. The PPS legislation (Public Law 98-21) required HCFA to review the DRG classification system and to make necessary adjustments in fiscal year 1986 and at least every 4 years thereafter. The Omnibus Budget Reconciliation Act of 1986 (Public Law 99-509) required that beginning in fiscal year 1988, the DRG classifications and weights be reviewed and adjusted annually.

In carrying out this responsibility, HCFA is required to publish annual notices setting forth the methodology and data used to determine the DRG rates and publish notices stating proposed and finalized changes in the DRGs and DRG weights. Through the first 3 years of PPS, HCFA made a number of changes to PPS that involved creating new DRGs or restructuring existing ones by shifting procedures/diagnoses from one DRG to another. Examples of some of the more significant changes are listed in appendix III.

The PPS legislation also established the Prospective Payment Assessment Commission (ProPAC)[2] to consult with and make recommendations to HCFA concerning the need for adjusting the DRGs. ProPAC is responsible for collecting and assessing information on medical and surgical procedures

[2]The legislation requires that ProPAC be composed of independent experts appointed by the Office of Technology Assessment. Currently, ProPAC consists of 17 members.

and services and for recommending changes to the structure and weights of existing DRGS and the creation of new DRGS. In 1985 and 1986, ProPAC made 13 recommendations encompassing 25 DRGS. HCFA made six of the recommended changes and rejected the other seven.

Objectives, Scope, and Methodology

Because the DRG classification system is the basis for PPS payments to hospitals, we wanted to determine the extent of variations in treatment resource requirements among patients classified into the individual DRGS and whether the level of variations affected the equity of payments among hospitals. Specifically, our objectives were to (1) measure the variations in the level of resources required to treat patients within each of the DRGS and identify any DRGS with wide variations in resource requirements, (2) determine if hospitals get an equal mix of high- and low-cost patients in DRGS where wide variations exist, and (3) determine if hospital characteristics, such as bed size and urban or rural location, help determine whether a hospital receives patients with higher- or lower-than-average treatment costs within the DRGS.

To accomplish our review objectives, we used five HCFA computerized files:

- The 1985 Medicare Patient Bill File, which contained 8.8 million claims submitted by 5,272 hospitals for payment for the year ended September 30, 1985.
- The Hospital Cost Report File, which contained reports for the hospitals' cost reporting period beginning after October 1, 1983, and before October 1, 1984 (this file contained 7,953 cost reports that had been revised or updated through June 24, 1986).
- Three additional HCFA files that contained hospital-specific information, such as wage indexes, number of interns and residents, and number of beds.

Before using the Patient Bill File, we deleted all claims identified on the file as being "outliers"[3] because such cases are atypical and thus could distort our measurement of variation within the DRGS. We also edited the Cost Report File to delete hospitals with missing or questionable data. Further, we deleted all hospitals from the file that were located in the four states where hospitals were not paid under PPS in fiscal year

[3]Outliers are claims that have an extraordinary high cost or length of stay when compared to most discharges classified in the same DRG. Hospitals are paid amounts higher than the DRG rates for cases qualifying as outliers.

1985—New York, New Jersey, Massachusetts, and Maryland.[1] We merged the edited Patient Bill and Cost Report Files, resulting in a file of 4,973 hospitals that submitted about 7.2 million claims for PPS payment.

To measure the variation in resource requirements within the DRGS, we first eliminated all DRGS with fewer than 100 discharges in fiscal year 1985. This resulted in 406 DRGS remaining for analysis. We then standardized the charges on each remaining claim by adjusting the charges for differences in wage levels and teaching status. We used the standardized charges for each claim to compute a coefficient of variation for each DRG. (See p. 16.) For further analysis, we also determined the national average standardized charge for each diagnosis/procedure in each DRG and the degree to which each varies from the DRG mean.

To determine if some hospitals consistently treat patients with higher or lower resource requirements in the wide-variation DRGS, we developed an index for each of the 4,973 hospitals. This GAO index measures the degree to which patient treatment costs within a DRG or group of DRGS vary from the mean for the DRG or group. (See pp. 21-23.)

The GAO index was developed using hospital costs rather than charges. We converted the charges on each of the 7.2 million Medicare claims to costs using hospital-specific cost-to-charge ratios for the hospital ancillary departments. These ratios were computed using the costs for each of these departments as reported on the cost report, less the direct medical education and capital-related costs. We also used the cost report to compute per-day rates for routine care, coronary care, and intensive care. Because the per-day rates were developed using cost report data for years starting on or after October 1, 1983, and before October 1, 1984, they were increased by 6.24 percent—the fiscal year 1985 change in HCFA's hospital market basket index, which is designed to measure changes in the prices hospitals pay for goods and services.

The principal sources of the automated data used in our analysis were the Medicare intermediaries' bill processing and payment systems, which are subject to HCFA reviews and examinations. HCFA relies on the data obtained from these systems as evidence of Medicare-covered services and expenditures and uses this information to support its management and budgetary decisions. Thus, we did not independently evaluate

[1]These states had waivers from PPS in 1985. These states were required to keep their aggregate Medicare expenditures below what they would be under PPS. In fiscal year 1986, Massachusetts and New York hospitals began participating in PPS.

the internal controls over or reliability of the Medicare intermediary automated systems. Except for this limitation, our work, which was done from July 1985 to October 1987, was performed in accordance with generally accepted government auditing standards.

We requested and received HHS comments on a draft of this report (see app. IV). Our responses to HHS's major comments are shown on pages 36-38; our analysis of specific points made by HHS is contained in appendix IV (see pp. 52-54).

DRGs—Wide Variations in Resource Requirements Affect Payment Equity

A primary goal of PPS is equitable payments to the hospitals that treat Medicare beneficiaries. Payment equity means that different hospitals should be paid a comparable, predetermined rate for like cases. To achieve this goal, it is important that the DRG case classification system accurately group patients with similar resource requirements. We found, however, that there are wide variations in treatment resource requirements in 148 (about 36 percent) of the 406 DRGs reviewed. The wide variations exist because the diagnoses and procedures grouped under the individual DRGs required substantially different resources for treatment.

Variations in resource requirements within a DRG are not necessarily a problem if hospitals treat an equal mix of patients with high and low resource requirements within the DRG—that is, if each hospital's average resource requirements for all patients treated within the DRG approximate the national average resource requirements for that DRG. We found, however, that "averaging" is not working in the DRGs with wide variations in resource requirements. Certain hospitals consistently treat patients with higher-than-average resource requirements, while others consistently treat patients with lower-than-average requirements. As a result, hospitals are penalized or rewarded based on the types of patients they receive rather than by factors related to efficiency.

Patient Resource Requirements Vary Widely Within Many DRGs

Medicare PPS is a hospital payment system based on "averaging"—that is, a hospital is paid based on the average resources required to treat certain conditions or diagnoses nationally rather than for the resources required to treat a specific patient. For PPS to work as intended, it is essential that the DRGs group patients who have similar treatment resource requirements. In that way, hospitals will be paid comparable amounts for the care of like cases, and the payments will be closely related to the resources necessary to treat each type of patient.

To evaluate the accuracy of the DRG classification system in grouping like patients, we measured the variations in resources required to treat patients within the 406 DRGs that had at least 100 discharges[1] in 1985.

[1]Our threshold of 100 discharges per DRG is more conservative than the 10-discharge-per-DRG minimum used by HCFA in establishing the DRG weights for fiscal year 1986. We believe, however, that the higher threshold is appropriate for our analysis because it provides a more substantial base for measuring variations in resource requirements within the DRGs.

Using patient charges as a measure of resource requirements, we computed the coefficient of variation for each DRG.[2]

The coefficient of variation is a relative measure of variability that is equal to the standard deviation[3] divided by the mean. Typically, this ratio is multiplied by 100 and expressed as a percentage—that is, the standard deviation as a percentage of the mean. For example, a DRG with a mean patient charge of $5,000 and a standard deviation of $2,500 would have a coefficient of variation of 50 percent.

The DRGs reviewed had coefficients of variation ranging from 31.7 to 217.6 percent, with 66 DRGs having ones of 100 percent or greater and 24 DRGs having ones of 50 percent or less. The distribution of the 406 DRGs reviewed, by coefficient of variation, is shown in table 2.1.

Table 2.1: Coefficient of Variation for DRGs Reviewed

Number of patients in millions

Coefficient of variation	Number of DRGs	Percent of DRGs	Number of patients	Percent of patients
100 or greater	66	16.3	0.7	9.6
50-99	316	77.8	6.1	84.7
Less than 50	24	5.9	0.4	5.7
Total	**406**	**100.0**	**7.2**	**100.0**

Source GAO analysis of fiscal year 1985 Patient Bill File

In general, a coefficient of variation of 50 percent or less suggests that there was only moderate variation in the standardized charges for the patients classified into the DRG. For example, DRG 39--a surgical DRG for eye diseases and disorders—had a coefficient of variation of 31.7 percent (a mean standardized charge of $2,328 and a standard deviation of $739). Our data base contained bills for 92,087 patients who were classified into this DRG in fiscal year 1985. These patients were treated with 1 of 25 different surgical eye procedures, ranging from the removal of a foreign body from the lens to a lens extraction. An analysis of the standardized charges for these procedures showed that the 19 most frequently performed procedures—representing about 97 percent of the

[2]We standardized the patient charges to remove variation due to (1) differences in hospital wage rates in different geographic locations and (2) the higher charge levels of teaching hospitals. We used the same method to standardize charges as that used by HCFA in developing the PPS payment rates

[3]The standard deviation is a statistical measure of the variability of a set of data. In general, it is the average difference between the mean and each of the data elements

patients classified into DRG 39—had mean standardized charges ranging from $2,009 to $2,499, a relatively narrow spread of $490.

In contrast, a coefficient of variation of 100 percent indicates wide variation in resource requirements to treat the patients within the DRG. For example, DRG 442—a surgical DRG for injuries to one of several body systems—had a coefficient of variation of about 100 percent, with a mean standardized charge of $6,046 and a standard deviation of $6,017. Our data base contained bills for 26,736 patients who were classified into DRG 442 in fiscal year 1985. These patients were treated with 1 of 781 different operating room procedures, ranging from eye repairs to brain surgery. Because of the wide spectrum of procedures included in this DRG, the mean standardized charges for these procedures varied widely, ranging from $549 to repair a detached retina using a laser (one patient) to $70,380 for the partial removal of the esophagus (three patients). Six hundred and eighty-three procedures, representing about 98 percent of the patients classified into DRG 442, had mean standardized charges ranging from $1,012 to $11,948—a relatively wide spread of $10,936.

The expected normal distribution of charges for the procedures performed in DRG 39 and DRG 442 are shown in figure 2.1, illustrating the difference between a DRG with a relatively low coefficient of variation and one with a relatively high coefficient of variation.

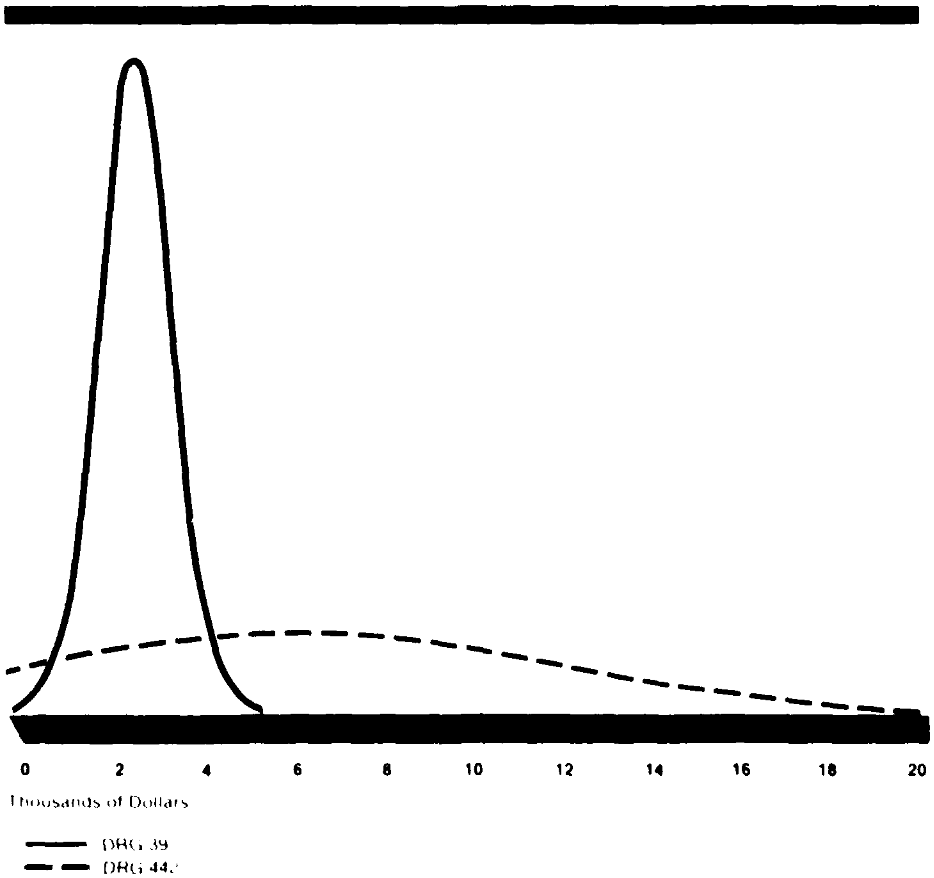
Hospitals Do Not Have an Equal Mix of High- and Low-Cost Cases

Variation in patient resource requirements within a DRG is not necessarily a problem in itself. The problem occurs when there is wide variation within a DRG and the distribution of patients across hospitals is such that some hospitals have a concentration of the high-cost patients in that DRG while others have a concentration of low-cost patients. We found this to be the case—603 hospitals (generally medium to large urban) consistently treated patients with higher-than-average resource requirements in the wide-variation DRGS, while 2,202 hospitals (generally small urban and small rural) consistently treated patients with lower-than-average requirements.

Hospital Patient Mix—An Important Factor Under PPS

Wide variation within a DRG means that the hospital resources required to treat any given patient could be either significantly higher or lower than the national average resource requirements for the DRG, and thus there is likely to be a disparity between treatment resource requirements and PPS payment on an individual case basis. This is not a problem if, overall, hospitals treat an equal mix of patients with high and

Figure 2.1: Expected Normal Distribution of Procedure Charges for DRG 39 and DRG 442 (Fiscal Year 1985)



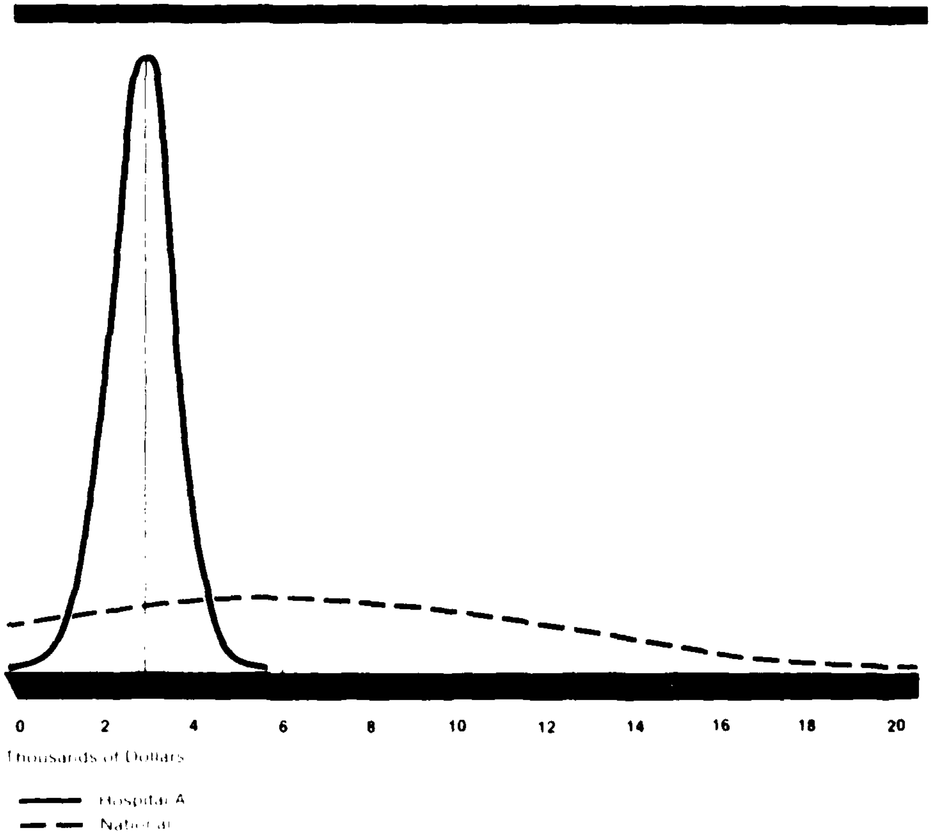
Source: GAO analysis of fiscal year 1985 Patient Bill File

low resource requirements within the DRG so that their average resource requirements for all patients in the DRG approximate the national average for that DRG. For example, in fiscal year 1985 one hospital treated 57 patients who were classified into DRG 442—a DRG with wide variation in resource requirements. The national mean standardized charges for the DRG 442 operating room procedures used by that hospital ranged from $2,078 to $11,866, with a weighted average of $5,847 for all procedures performed. This closely approximated the national average resource requirement of $6,046 for the DRG.

However, when there is wide variation within a DRG, a hospital could get a concentration of patients with treatment resource requirements that are either higher or lower than the national average for the DRG. For example, another hospital treated 97 patients who were classified into

DRG 442 in fiscal year 1985. The hospital treated these patients with 1 of 20 different operating room procedures that had national mean charges *ranging from* $1,827 *to* $5,733, with a weighted average of $2,831. This was well below the national average patient resource requirement for DRG 442 of $6,046. The experience of this hospital ("Hospital A") with DRG 442 is illustrated in figure 2.2.

Figure 2.2: Expected Normal Distribution of Procedure Charges for DRG 442, Nationally, and for Hospital "A"
(Fiscal Year 1985)



According to HCFA officials, the critical question in determining fairness of the DRG classification system is whether the latter condition is widespread—that is, whether certain hospitals receive patients whose average treatment requirements are significantly higher or lower than the national average for a given DRG. If so, hospitals could have incentives to

transfer or avoid some patients while selectively recruiting others. Such incentives could disrupt the health care system and create barriers to some Medicare beneficiaries.

Others have expressed similar concerns. One group of authors knowledgeable about Medicare PPS wrote the following:

> "Assuming both efficient practice and a well-chosen DRG price, these patients' costs should vary moderately around the (DRG payment) price without a strong skew toward either high or low costs. Some variation in cost within a DRG is not a cause for concern; variation only becomes a problem when it is both systematic and a function of identifiable patient attributes. If certain identifiable types of patients tend to cost either more or less than the DRG specific price, then there is a risk that hospitals will begin to select for the low-cost group and against the high-cost group."[4]

Measuring Hospital Resource Requirements in Wide-Variation DRGs

We attempted to determine if certain hospitals receive patients whose treatment resource requirements are consistently higher or lower than the national average for the wide-variation DRGs. To do this, it was necessary to measure each hospital's expected average cost per case for the wide-variation DRGs relative to the national average cost of treating all Medicare patients in these DRGs.[5]

We first considered using HCFA's case-mix index (CMI), which is a relative measure of the costliness of the patients treated at a given hospital. However, we found this index was not suitable for our purposes because of the way HCFA determines each hospital's expected average treatment cost. In computing the CMI, a hospital's expected average cost[6] is determined by multiplying the proportion of a hospital's total caseload in each DRG by the national average cost[6] for that DRG and summing the results for all the DRGs. The hospital's expected average cost obtained in this manner is then divided by the national average cost of treating all Medicare cases to arrive at the hospital CMI.

[4]Helen L. Smits, Robert B. Fetter, and Laurence F. McMahon, Jr., "Variation in Resource Use Within Diagnosis Related Groups: The Severity Issue," Health Care Financing Review (1984 Annual Supplement), pp. 71-79.

[5]It is important to note that a hospital's "expected average cost" is not the same as a hospital's "actual average cost." The expected average cost for each hospital case is the national average cost for each diagnosis/procedure. Therefore, we maintain an efficiency factor in our analyses similar to PPS's and are not comparing a hospital's actual costs to its Medicare payments.

[6]HCFA actually uses standardized charges, rather than cost, as a measure of hospital resource requirements.

By using the national average cost of the DRGS as a basis for computing this index, HCFA in effect is assuming that all patients within a DRG have the same resource requirements. Thus, the CMI is actually measuring the relative costliness of the DRGS assigned to a hospital's cases rather than the relative costliness of patients treated within the DRGS—the condition that we were trying to measure.

Therefore, for analysis purposes we developed our own index to identify hospitals that treat patients with higher or lower resource requirements in the wide-variation DRGS. Using the ICD-9-CM codes, we grouped patients by principal diagnosis (for the medical DRGS) or primary operating room procedure performed (for the surgical DRGS).[7] Next, we (1) determined the national mean cost[8] for each principal diagnosis and for each primary operating room procedure, (2) determined the percentage of a hospital's total Medicare caseload that each diagnosis/procedure represented, (3) multiplied that percentage by the national mean diagnosis/procedure cost, (4) summed the results to get the hospital's expected average cost per Medicare case, and (5) divided the hospital's expected average cost by the national average cost of treating all Medicare patients in the group of DRGS being analyzed to get a hospital's index.

An example of the computation of the HCFA CMI, the GAO index, and the difference between the two is shown in table 2.2. The computations are based on the following hypothetical information:

- In 1985, a hospital treated only two Medicare patients, both in DRG "X". DRG "X" is a surgical DRG with operating room procedures ranging in cost from $2,000 to $8,000 and a national average cost for the DRG of $4,000.
- The hospital treated the first patient with an operating room procedure (ICD-9-CM code "1234") that had a national average cost of $8,000; the second patient was treated with an operating room procedure (ICD-9-CM code "1235") that had a national average cost of $6,000.
- The average cost of all Medicare patients treated nationally was $5,000.

[7] Because patients are grouped into the DRGs based on the principal diagnosis or primary operating room procedure, we were in effect breaking the DRGs down into their components.

[8] We believe that hospital costs, rather than charges, are a better measure of resource requirements. We therefore converted bill charges to costs using hospital-specific cost-to-charge ratios developed from the hospital cost reports. We standardized the costs to adjust for differences due to wage levels and teaching intensity.

Table 2.2: Example of Difference in Computation of HCFA's CMI and GAO Index

CMI:	Cases	Proportion of Medicare caseload	×	National average cost—DRG	=	Hospital expected cost	÷	National average cost—all Medicare cases	=	CMI
DRG "X"	2	100%		$4,000		$4,000		$5,000		.80
GAO Index:	**Cases**	**Proportion of Medicare caseload**	**×**	**National average cost—procedure**	**=**	**Hospital expected cost**	**÷**	**National average cost—all Medicare cases**	**=**	**GAO index**
Procedure "1234"	1	50%		$8,000		$4,000				
Procedure "1235"	1	50%		6,000		3,000				
						$7,000		$5,000		1.40

As shown in the table, using the CMI methodology results in an index of 0.80, indicating that the hospital's Medicare patients had an expected average treatment cost that was about 20 percent lower than the national average treatment cost for all Medicare patients. However, the expected costs for the two patients treated by this hypothetical hospital were about 40 percent higher than the national average, as indicated by the GAO index of 1.40. The difference between the two indexes is discussed further on pages 24-29.

Because we were primarily interested in hospital expected treatment costs in the wide-variation DRGs, we first divided the 406 DRGs in our data base into three groups with varying amounts of variation in resource requirements—148 DRGs with coefficients of variation ranging from 90 to 217.6, 139 DRGs with coefficients from 72 to 89.9, and 119 DRGs with coefficients from 31 to 71.9. We divided the DRGs in this manner so that each grouping would have enough discharges to help ensure a meaningful analysis. Table 2.3 shows the range of variation, the number of DRGs, and the number of discharges for each of the three groups.

Table 2.3: Three Groups of DRGs Analyzed

Number of discharges in millions

Group	Range of variation	Number of DRGs	Number of discharges	Percent of discharges
A	90.0 - 217.6	148	2.1	29.6
B	72.0 - 89.9	139	3.0	42.3
C	31.0 - 71.9	119	2.0	28.1

Source: GAO analysis of fiscal year 1985 Patient Bill File

We then computed an overall GAO index for each hospital for the group of 148 DRGS with the greatest variation to determine if certain hospitals consistently treat patients with higher- or lower-than-average resource requirements in those DRGS. We found that 2,164 hospitals (about 44 percent of those analyzed) had an index that fell within a range of from 0.95 to 1.05 for this group of DRGS. This means that patients treated by these hospitals in the wide-variation DRGS had an expected average cost that was within 5 percent (plus or minus) of the national average treatment cost for all patients in this group of DRGS, suggesting that they treated a relatively equal mix of patients with high and low treatment costs within these DRGS.

On the other hand, however, 2,202 hospitals had an index that fell within a range of from 0.40970 to 0.94994, suggesting that the patients treated by these hospitals in the wide-variation DRGS had an expected average treatment cost that was from about 5 to 60 percent lower than the national average for the wide-variation DRGS. Likewise, 603 hospitals had an index that shows that they treated patients with an expected average treatment cost that was from about 5 to 50 percent higher than the national average for these DRGS. Thus, our analysis indicates that a significant number of hospitals treated patients in the wide-variation DRGS who had treatment costs that were expected to be consistently higher or lower than the national average for these DRGS. The range of GAO indexes for the wide-variation DRGS for the hospitals analyzed is shown in table 2.4.

Table 2.4: Hospital Indexes for 148 Wide-Variation DRGs

GAO index	Number of hospitals	Percent of hospitals
0.40970 to 0.94994	2,202	44.3
0.95000 to 1.05000	2,164	43.5
1.05001 to 1.49221	603	12.1
Total	**4,969[a]**	**99.9[a]**

[a]Four hospitals did not treat any Medicare patients in the 148 DRGs being analyzed.

Source: GAO analysis of fiscal year 1985 Patient Bill File.

Variation and Patient Mix Affect Payment Equity

Because hospital payments under PPS are based on the national average resource requirements for the various DRGS, hospitals that consistently treat patients with expected treatment costs that are higher than average would be undercompensated, while those that consistently treat patients with expected treatment costs that are lower than average would be overcompensated.

We used the GAO index and the CMI to illustrate the relationship between hospital cost and Medicare payments. As discussed on page 20, the CMI is used as a relative measure of patient resource requirements at a given hospital. However, because the CMI and the DRG payment weights are both based on the national average cost of patients treated within the DRGs, the CMI can also be used as a relative measure of hospital Medicare payments. The GAO index measures the degree to which a hospital's expected patient treatment costs within a DRG vary from the national average cost of the DRG. Thus, the difference between the two indexes gives an indication of the potential for over- or undercompensation for patients treated in a DRG or group of DRGs.

Hospitals With Higher-Than-Average Expected Treatment Costs in Wide-Variation DRGs

We analyzed the relationship between the GAO index and the CMI (that is, between expected cost and payment) for the 603 hospitals that treated patients with the highest expected treatment costs in the 148 wide-variation DRGs. We found that 504 of the 603 hospitals (about 84 percent) had a GAO index that was higher than their CMI for these DRGs, indicating that expected *treatment* costs were greater than payments for those hospitals. The difference between the GAO index and the CMI for the 504 hospitals ranged from 0.38923 (a hospital with a GAO index of 1.38500 and a CMI of 0.99577) to 0.00028, with an average difference of about 0.03834.

The experience of one of the 603 hospitals in one of the wide-variation DRGs illustrates the difference between the GAO index and the CMI in terms of expected costs and payments. The hospital in question treated 112 patients who were classified into DRG 12. DRG 12, a medical DRG for certain diagnoses pertaining to nervous system disorders, has a coefficient of variation of 108.8. Table 2.5 shows the diagnosis codes of the patients treated by the hospital, the expected cost of the patients treated, and the expected payments (assuming that the payments equaled the national average cost of all patients treated in the DRG).

Table 2.5: One Hospital's Expected Costs and Payments for Patients Treated in DRG 12

	Expected cost			Expected payment		
Diagnosis code	National average cost (diagnosis)	Patients	Expected cost	National average cost (DRG)	Patients	Expected payment
3319	$2.038	1	$2.038	$3.187	1	$3,187
3310	2.126	2	4.253	3.187	2	6,373
3313	2.332	2	4.664	3.187	2	6.373
3320	2.339	1	2.339	3,187	1	3.187
33520	2.384	1	2.384	3.187	1	3,187
3330	2.406	3	7,219	3,187	3	9.560
3580	3.010	1	3.010	3.187	1	3.187
33523	3.021	1	3.021	3.187	1	3.187
3337	3.593	1	3.593	3.187	1	3.187
4380	4.383	2	8.766	3.187	2	6.373
3429	5.754	97	558.090	3.187	97	309.095
Total		**112**	**$599,375**		**112**	**$356,894**

Source GAO analysis of fiscal year 1985 Patient Bill File

As shown in the table, the hospital treated 112 patients having 11 of the 52 diagnoses covered by DRG 12. The national average cost of treating all Medicare patients (33,215) in DRG 12 was about $3,187. If the hospital in question were paid this amount for each of its 112 discharges in the DRG (as is the concept under PPS), total payments would have been about $357,000. However, 100 of the 112 patients treated (about 89 percent) had diagnoses that had expected treatment costs that were higher than the national average for the DRG—resulting in total expected treatment costs for the DRG of about $599,000. Based on these data, the hospital would have a GAO index of 1.68 and a CMI of 1.00 for this DRG. Thus, in this case a difference of 0.68 between the two indexes would equate to an expected payment that was about $242,000 lower than the expected cost for this DRG.

We also wanted to determine how the relationship between expected cost and payment in the other groups of DRGs—the 139 DRGs with moderate variation in resource requirements and the 119 DRGs with low variation—compared to that in the wide-variation DRGs. That is, as variation in resource requirements within the DRGs decreases, what happens to the relationship between expected cost and payment? We used the GAO index to identify hospitals that treated patients who had higher-than-average expected treatment costs in the other two groups of DRGs. We

then analyzed the relationship between the GAO index and the CMI for all hospitals with a GAO index greater than 1.05 for the two groups of DRGS and compared the results to those obtained from the analysis of the wide-variation DRGS.

We found that the number of hospitals treating patients with higher-than-average expected treatment costs (GAO indexes greater than 1.05) was comparable for all three groups of DRGS (see app. II, table II.1). However, the GAO indexes and CMIS for the moderate- and low-variation DRGS were about equal for virtually all of the hospitals. This suggests that, while the patients treated by these hospitals in the two groups had higher-than-average expected treatment costs, there was a close relationship between expected cost and payment. In contrast, 114 (about 19 percent) of the 603 hospitals treating patients with higher-than-average expected treatment costs in the wide-variation DRGS had a GAO index that was at least 0.05 higher than the CMI, suggesting that the higher expected treatment costs were not adequately reflected in the reimbursement. The relationship between expected costs and expected payments for hospitals with the higher-than-average expected treatment costs in the three groups of DRGS is illustrated in figure 2.3.

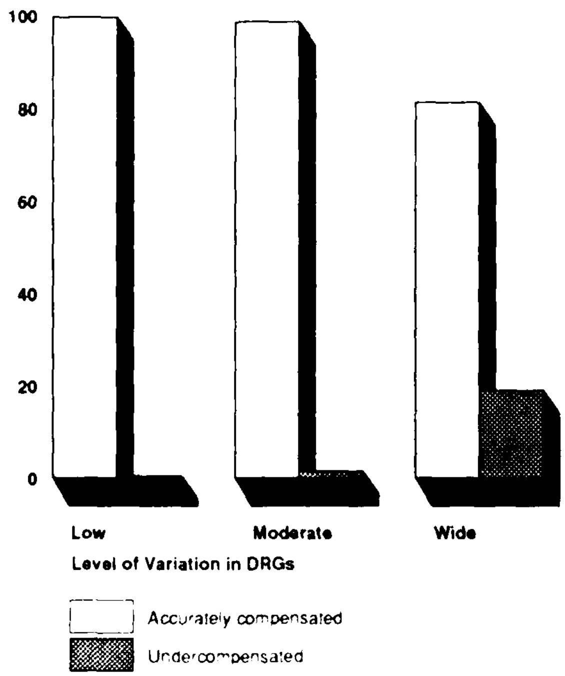
As can be seen in the figure, the disparity between expected costs and expected payments increases as the level of variation in the DRGS increases. Thus, our analysis supports one of the major underlying concepts of PPS—the more homogenous the DRGS in terms of resource requirements, the more equitable the payments to hospitals.

Hospitals With Lower-Than-Average Treatment Costs in Wide-Variation DRGs

We made a similar analysis of the relationship between the GAO index and the CMI for the 2,202 hospitals that treated patients who had the lowest expected treatment costs (a GAO index of less than 0.95) in the 148 wide-variation DRGS. We found that 1,848 of the 2,202 hospitals (about 84 percent) had a CMI that was higher than the GAO index for these DRGS, indicating potential overcompensation to those hospitals. The difference between the CMI and the GAO index for the 1,848 hospitals ranged from 0.68352 (a hospital with a CMI of 1.38073 and a GAO index of 0.69721) to 0.00003, with an average difference of 0.03302.

Again, to illustrate what the difference between the CMI and GAO index means in terms of hospital payments, we will use the experience of one of the 2,202 hospitals in one of the wide-variation DRGS. The hospital

Figure 2.3: Relationship Between DRG Variation and Reimbursement for Hospitals With Higher-Than-Average Expected Costs (Fiscal Year 1985)



Note Degree of undercompensation was calculated by subtracting the CMI from the GAO index Accurate compensation was a difference of 0 4 or lower Undercompensation was a difference of 0 5 or higher

This chart only includes hospitals that have a GAO index greater than 1 05

treated 93 patients who were classified into DRG 461, a "catchall" surgical DRG for any operating room procedure "with diagnoses of other contact with health services." DRG 461 has a coefficient of variation of 137.3. Table 2.6 shows the procedure codes of the patients treated by the hospital in this DRG, the expected cost of the patients treated, and the expected payments (assuming that the payments equaled the national average cost of all patients treated in the DRG).

Table 2.6: One Hospital's Expected Costs and Payments for Patients Treated in DRG 461

	Expected cost			Expected payment		
Procedure code	National average cost (procedure)	Patients	Expected cost	National average cost (DRG)	Patients	Expected payment
4899	$494	18	$8,894	$2,592	18	$46,658
4549	1,095	2	2,190	2,592	2	5,184
4541	1,209	68	82,198	2,592	68	176,262
493	1,230	1	1,230	2,592	1	2,592
4835	2,224	3	6,671	2,592	3	7,776
5412	2,731	1	2,731	2,592	1	2,592
Total		**93**	**$103,914**		**93**	**$241,064**

Source: GAO analysis of fiscal year 1985 Patient Bill File.

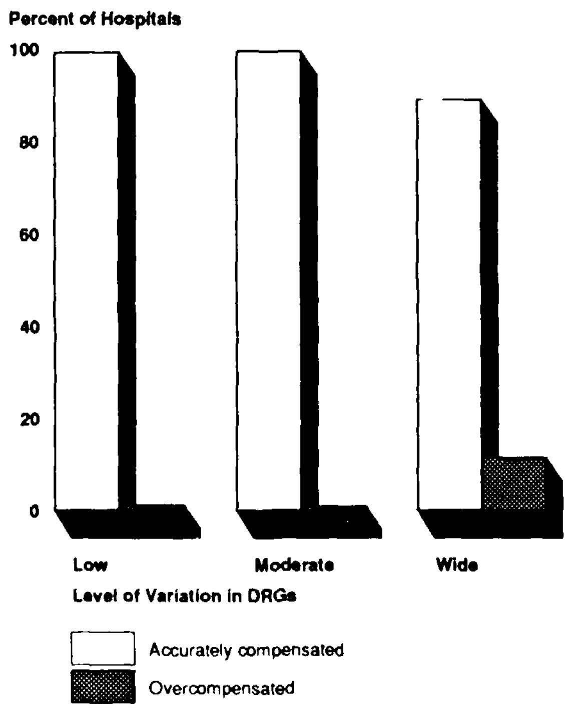
As can be seen in the table, this hospital treated 93 patients with 6 of the 726 operating room procedures covered under DRG 461. The national average cost of treating all Medicare patients (5,925) in DRG 461 was about $2,592. If the hospital in question were paid this amount for each of its 93 discharges in the DRG (as is the concept under PPS), total payments would have been about $241,000. However, 92 of the 93 patients treated at this hospital were treated with procedures that had expected costs that were lower than the national average for the DRG, resulting in total expected treatment costs of about $104,000. Based on these data, the hospital would have a GAO index of 0.43 and a CMI of 1.00 for this DRG. Thus, in this case a difference of 0.57 between the two indexes would equate to an expected payment that was about $137,000 higher than the expected cost for this DRG.

We also identified the hospitals that consistently treated patients with lower-than-average treatment costs (a GAO index of less than 0.95) in the moderate- and low-variation DRGs. Again, we measured the difference between the CMI and the GAO index for those hospitals and compared the results across the three groups of DRGs. We found a large number of hospitals treated patients with lower-than-average expected treatment costs in each of the three groups of DRGs (see app. II, table II.2). The lower expected treatment costs for patients in the moderate- and low-variation DRGs apparently resulted in commensurately low payments as evidenced by the fact that the GAO indexes and CMIs were about equal for virtually all of the hospitals represented in these two groups of DRGs. In contrast, 249 (about 11 percent) of the 2,202 hospitals treating patients with lower-than-average expected treatment costs in the wide-variation

DRGs had a CMI that was at least 0.05 higher than the GAO index, suggesting potential overcompensation to those hospitals.

The relationship between expected costs and expected payments for hospitals with lower-than-average expected treatment costs in the three groups of DRGs is illustrated in figure 2.4.

Figure 2.4: Relationship Between DRG Variation and Reimbursement for Hospitals With Lower-Than-Average Expected Costs (Fiscal Year 1985)



Note Degree of overcompensation was calculated by subtracting the GAO index from the CMI: Accurate compensation was a difference of 0.4 or lower; Overcompensation was 0.5 or higher.

This chart only includes hospitals that have a GAO index less than 0.95.

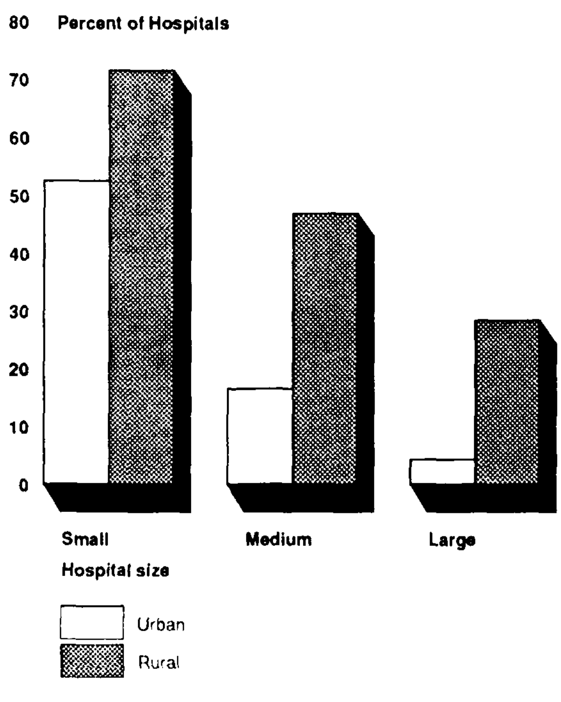
As illustrated in the figure, the disparity between expected costs and expected reimbursement increases as variation in the DRGs increases—again showing that the potential for inequitable payments is greatest where there is wide variation in resource requirements within the DRGs.

Location and Size of Hospitals With High- and Low-Cost Patients

Another important issue in evaluating the DRG classification system is whether the high- and low-cost patients within the wide-variation DRGs are distributed randomly across hospitals or whether they are distributed systematically—that is, whether certain hospital characteristics, such as location and size, can help determine whether a hospital will receive patients with expected treatment costs that are consistently lower or higher than the national average.

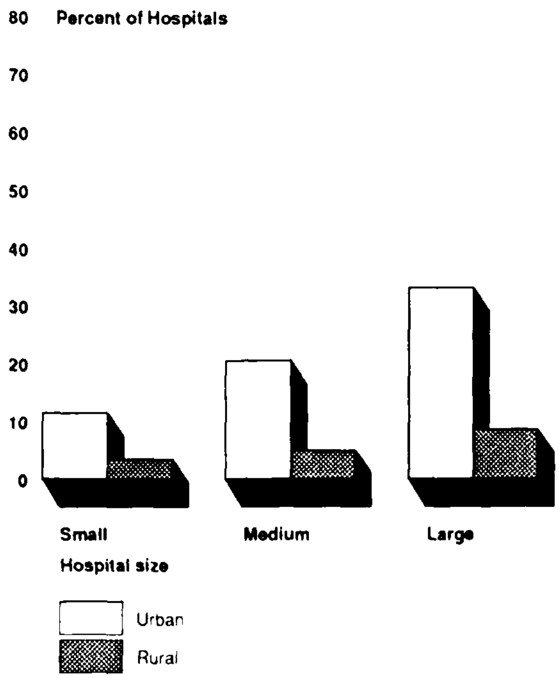
To address this question, we stratified the two groups of hospitals with the lowest and highest GAO indexes for the 148 wide-variation DRGs by location and bed size. The results of our analysis are illustrated in figures 2.5 and 2.6 and in appendix II, table II.3.

Figure 2.5: Location and Bed Size of Hospitals With Lower-Than-Average Expected Costs in Wide-Variation DRGs
(Fiscal Year 1985)



Note: Hospital sizes are based HCFA definitions. For Urban hospitals: Small < 100 beds, Medium = 100 to 404 beds, and Large > 404 beds. For Rural: Small < 100 beds, Medium = 100 to 169 beds, and Large > 169 beds.

Figure 2.6: Location and Bed Size of Hospitals With Higher-Than-Average Expected Costs in Wide-Variation DRGs
(Fiscal Year 1985)



Note: Hospital sizes are based HCFA definitions. For Urban hospitals Small < 100 beds, Medium = 100 to 404 beds, and Large > 404 beds. For Rural Small < 100 beds, Medium = 100 to 169 beds and Large > 169 beds.

As illustrated in the figures, all types of hospitals received patients in the wide-variation DRGs that had expected treatment costs that were consistently lower than average for these DRGs, and all types received patients with expected treatment costs that were consistently higher than average. However, about 53 percent of the urban hospitals with fewer than 100 beds and about 72 percent of the rural hospitals with fewer than 100 beds received patients who had an expected average treatment cost that was lower than the national average cost for the wide-variation DRGs. The distribution of patients with higher-than-average expected treatment costs was less concentrated, but the larger urban hospitals were more likely to receive such patients than were any other hospital type.

Our use of the GAO index, and its comparison to the CMI, was for analysis and illustration purposes only. It was not meant to imply that the GAO index or method of grouping patients should be used for payment purposes. Further, our discussion of under- and overcompensation was meant to demonstrate the overall effect of variation in the DRGs on hospital payment equity. This analysis, however, should not necessarily be equated with profit or loss for specific hospitals or types of hospitals. First, as described on pages 20-21, we used national average costs for patients grouped by primary diagnosis and operating room procedure to determine a hospital's expected average cost per case. A hospital's cost for treating individual patients can vary from these national averages due to the hospital's practice patterns and level of efficiency; thus, a hospital's "actual" average treatment cost can and probably does vary from the "expected" average treatment cost.

Conclusions

Wide variations in patient treatment costs exist in many DRGs. While this is not a problem in itself, it has become a problem because many hospitals received an unequal mix of patients with low and high expected treatment costs within the wide-variation DRGs. Further, the distribution of low- and high-cost patients in these DRGs appears to be systematic in that most of the small urban and rural hospitals consistently received patients with below-average treatment costs, while large urban hospitals were most likely to receive patients with above-average treatment costs. Because hospital payments under PPS are based on average DRG costs, this situation results in inequitable payments.

Under PPS, hospitals should have an incentive to cut costs through improved efficiency. However, if hospitals are rewarded or penalized based on the types of patients they receive rather than the efficiency of their operations, an unintended result could occur: hospitals could have incentives to encourage the admission of Medicare beneficiaries with diagnoses with treatment costs that are less than the DRG payments and to discourage the admission of those with diagnoses that have treatment costs that are higher than the DRG payments.

Options Available to Reduce DRG Variations

We believe that, overall, the DRG case classification system provides a good basis for determining hospital payments under PPS. However, as discussed in chapter 2, wide variations in treatment resource requirements exist in many of the DRGS. Reducing the variations within the DRGS can be accomplished by creating more DRGS or changing the makeup of existing DRGS.

Creating Additional DRGs

One method of reducing the resource variations in the DRG classification system is to create new DRGS for those diagnoses or procedures that vary significantly in resource requirements from the other diagnoses or procedures within an existing DRG. For example, before fiscal year 1986, patients who underwent a single joint replacement (knee or hip) as well as those who underwent bilateral joint replacements (both knees or hips) were classified into DRG 209—even though the bilateral replacements required significantly more hospital resources to treat than did the single joint replacements. After receiving complaints from hospital administrators, physicians, and professional societies, HCFA established a new DRG (DRG 471) for multiple joint replacements effective March 15, 1986.

Similarly, until fiscal year 1988, the DRG classification system did not distinguish between patients with respiratory disorders who required assistance in breathing (mechanical ventilation) and those who did not. After receiving several complaints from the medical community, HCFA evaluated this situation and found that patients requiring mechanical ventilation had average charges that were from 2 to 10 times higher than those not requiring mechanical ventilation.

HCFA concluded that patients with respiratory disorders could be classified into one of three distinct groups according to resource requirements—those requiring no mechanical ventilation, those requiring some mechanical ventilation and who gain access to the ventilator through endotracheal tubes, and those requiring mechanical ventilation for extended periods and who gain access through a tracheostomy. Accordingly, HCFA created two new DRGS—474 and 475—to recognize the higher resources required to treat patients needing mechanical ventilation. This change to the DRG classification became effective October 1, 1987.

Restructuring Existing DRGs

Restructuring the existing DRGS is another means of reducing variations within the DRGS. This can be done by reclassifying selected diagnoses or procedures from one DRG to another. For example, HCFA's analysis showed that three surgical procedures involving the abdominal arteries and veins that were being classified into DRG 112 were similar in resource requirements to other abdominal procedures that were classified into DRGS 110 and 111. Accordingly, HCFA changed the DRG classification system so that the procedures in question will be grouped in DRGS 110 and 111, effective October 1, 1987. In the past, HCFA has restructured a number of DRGS (see app. III).

We believe that reclassifying diagnoses and/or procedures from the wide-variation DRGS to other DRGS would be beneficial in additional situations. Reclassification may be particularly appropriate for those DRGS, such as DRGS 442 and 443,[1] that include diagnoses or procedures pertaining to multiple body systems.

Operating room procedures are normally classified into a variety of surgical DRGS based on the body system involved. However, operating room procedures performed to correct problems or complications resulting from prior surgery ("revisions") are classified into DRGS 442/3, regardless of the organ or body system involved. For example, the surgical procedure for initially replacing a knee or a hip is classified in DRG 209, while the surgical procedure for repairing these artificial joints, should a problem arise, is classified in DRG 442.

We found several instances where the resource requirements of the revision procedures were more similar to the average resource requirements of the DRG containing the original surgical procedure than to the average resource requirements for DRGS 442 or 443. For example, a corneal transplant procedure in DRG 442 had a standardized charge of $2,935, which was very close to the average standardized charge of $2,702 for DRG 42, the DRG that contains the original surgical eye procedure. However, this varied significantly from the average standardized charge of $6,046 for DRG 442, where this revision procedure is currently classified.

Table 3.1 shows the average standardized charges for a number of procedures currently classified in DRG 442 and compares them to the average standardized charge for that DRG and to the average standardized charge for the DRG containing the original surgical procedure.

[1] DRGs 442 and 443 cover the same primary diagnoses and procedures. However, patients classified into DRG 442 also have certain secondary diagnoses ("complications and comorbidities") (see p. 35).

Table 3.1: Comparison of Selected DRG 442 Procedure Charges to Average DRG Charges

Description	Procedure average standardized charge	Average standardized charge—DRG 442	Original DRG	
			Number	Average standardized charge
Corneal transplant	$2,935	$6,046	42	$2,702
Vessel incision—lower limb	8,084	6,046	112	7,626
Vascular shunt or bypass	9,547	6,046	110	12,334
Removal of lesion	3,288	6,046	269	3,861
Removal of hip prosthesis	11,866	6,046	210	7,580
Other total hip replacement	11,423	6,046	209	9,484

Source: GAO analysis of fiscal year 1985 Patient Bill File

Reclassifying patients within DRGs can also be done based on patient characteristics other than the principal diagnosis or primary operating room procedure. Originally, the DRG classification system contained 95 "pairs" of DRGs that each contained the same principal diagnoses and primary operating room procedures. One of the pair, however, was for patients who had at least one of the approximately 2,700 serious secondary diagnoses ("complications and comorbidities") and/or who were 70 or older. The DRG pairs were established because data used to develop the DRGs showed that patients with complications and comorbidities and patients who were 70 years and older generally required more resources to treat. DRGs 442 and 443 discussed above are an example of such DRG pairs.

In an April 1987 report to the Secretary of HHS, ProPAC stated that its analysis showed that resource use for Medicare patients 70 years and older without a complication or comorbidity was significantly lower than for those patients in the same DRGs with a complication or comorbidity. ProPAC recommended dropping age as a criterion for classifying patients into the DRGs—that is, that the DRG pairs should be defined based on the presence or absence of a complication or comorbidity regardless of age.

Based on this recommendation, HCFA conducted a similar analysis and reached the same conclusion. HCFA implemented ProPAC's recommendation effective October 1, 1987. Some of the wide-variation DRGs we identified were affected by this change, and the DRG restructuring may help reduce their variation somewhat.

Conclusions

Our analyses illustrate that the theory behind PPS does not work for DRGS where there is a wide variation in patient treatment costs because many hospitals consistently treat patients who have expected treatment costs that are either lower or higher than the average cost (the payment) for these DRGS. Thus, whether a hospital profits or loses on cases in these wide-variation DRGS depends more on the mix of patients it treats than on its relative efficiency as envisioned under PPS. Our analysis also showed that hospitals in particular bed-size/location groupings are more likely to treat patients who have expected treatment costs that are either higher or lower than the average costs for the wide-variation DRGS.

Variation in treatment costs within DRGS can be reduced by establishing new DRGS with less variation and/or by realigning diagnoses/procedures among existing DRGS. We believe that HHS should take action to reduce intra-DRG variation to prevent hospitals from having incentives for seeking or avoiding patients with particular diagnoses/procedures within wide-variation DRGS. This would help assure that access to care for Medicare beneficiaries is not affected by such incentives and would also increase the equity of payments to hospitals under PPS.

Recommendations

We recommend that the Secretary of HHS direct the Administrator of HCFA to review those DRGS that we have identified as having wide variations in patient resource requirements and change the DRG classification system to reduce the variations within these DRGS.

Agency Comments and Our Evaluation

In commenting on a draft of this report, HHS stated that it believed its current activities were sufficient to address the need for improvement in the hospital payment system and that additional activities were unnecessary. HHS cited its statutory obligation to adjust DRG classifications and weighting factors annually to reflect changes in treatment patterns, technology, and other factors that may affect relative resource use. HHS said that this statutory requirement, combined with the fact that it has only proposed DRG classification changes that would reduce resource variation within DRGS, was evidence that it was already meeting the spirit of our recommendation. HHS also pointed out several adjustments to payment rates for individual hospitals that it believed would mitigate the inequities in payments to hospitals. HHS expressed concern that readers would expect greater improvements in the distribution of payments across hospitals by refining the DRGS further along the lines we suggested.

We recognized HHS's obligation to review and revise the DRG classifications (see p. 11), and noted the changes to these classifications that HHS has made (see p. 37). We undertook our review to assess whether the DRGs were grouping patients with similar treatment costs as intended and, if not, whether the equity of payments to hospitals was adversely affected. Our analysis shows that while the DRG classification system overall is doing a good job of assigning cases for payment purposes, excessive variations in expected treatment costs exist in many DRGs. HHS's DRG classification review and revision process has not corrected this wide-variation problem. We believe that refining some DRGs further would result in improvements in payment distribution. The methods we suggested for refinement have been used by HCFA in the past.

We believe that HHS's comments that adjustments made for various hospital-specific circumstances mitigate the inequities in payments are irrelevant to the question of whether DRG classifications appropriately group cases that have similar resource requirements. As discussed on page 10, two factors determine how much a hospital is paid under PPS. One is the DRG classification system that groups cases and, *in turn*, results in the weighting factors for DRGs—the subject of this report. The second factor is the dollar conversion factor (i.e., the standardized amount), which is multiplied by the DRG weight to arrive at the actual PPS payment a hospital receives. In general, it is the adjustments to the dollar conversion factor that HHS is referring to in its comments. This report does not deal with the computation of the dollar conversion factor, although we have issued reports on problems with it.[2] The Medicare statute envisions that both the DRG classifications and the standardized amount will be accurate and appropriate to assure reasonable and equitable rates and requires HHS to review and revise both factors annually. Thus, the adjustments to the standardized amount, while important to payment equity, do not lessen the need to correct problems in the DRG classifications.

Finally, regarding our concern that the wide-variation DRGs give hospitals inappropriate incentives to seek or avoid patients with particular diagnoses or needing specific procedures, HHS said that its research to date has found no evidence of discrimination against or access problems for high-cost beneficiaries. Our concern is that over time hospitals could react to the incentives provided by the wide-variation DRGs, and we

[2]For example, see Medicare: Past Overuse of Intensive Care Services Inflates Hospital Payments, GAO/HRD-86-25, March 7, 1986, which summarizes much of our work related to problems with PPS's standardized amounts.

believe it is desirable to remove perverse incentives before they result in negative effects.

HHS's specific comments are further discussed in appendix IV, pages 52-54.

DRGs With Coefficients of Variation Greater Than 90 Percent

DRG	Number of discharges	Coefficient of variation
456	122	217 57
460	2,218	214 04
454	4,066	156 43
76	7,091	155.40
7	4,550	154 15
457	219	152 05
458	1,189	151 83
461	5,925	137 33
466	2,985	134 63
83	7,013	134 55
69	3,139	133 87
459	615	132 35
467	5,303	131 20
169	2,298	130 89
27	1,503	127 83
131	9,203	126 05
9	2,258	124 60
267	488	122 00
168	5,867	121.10
46	3,229	120 05
269	10,554	120 01
439	1,270	119 36
18	12,975	118 94
34	11,672	117 06
23	4,360	116 84
403	31,201	115 24
28	7,403	114 76
404	3,792	113 48
256	9,185	113 13
453	3,592	112 94
35	2,192	111 60
421	10,477	110 51
20	4,423	110 34
188	32,772	110 18
293	338	109 86
94	6,488	109 13
77	2,114	109 02
12	33,215	108 78
437	1,188	108 73
87	78,551	108 47

(continued)

DRG	Number of discharges	Coefficient of variation
394	1 725	108 24
201	2 605	107 96
129	8 285	107 44
468	92 647	107 14
397	6 922	106 62
425	12 474	106 61
101	21 602	105 52
315	7 654	104 81
64	5 818	104 69
438	17 852	104 36
452	17 614	104 28
120	10 393	104 20
57	512	103 59
299	892	103 46
135	7 183	103 45
63	3 305	103 42
249	3 973	103 24
444	5 147	103 00
366	5 605	103 00
192	1 728	102 57
428	1 678	102 55
123	48 872	102 16
217	4 780	102 06
325	18 327	101 42
24	40 965	100 54
392	1 357	100 46
449	29 959	99 99
316	29 711	99 78
185	4 061	99 75
29	747	99 71
442	26 736	99 52
431	479	99 39
288	375	99 38
445	772	99 25
172	28 639	99 01
67	200	99 00
415	11 785	98 93
423	5 807	98 90
265	3 375	98 54
427	2 630	98 45
400	4 770	98 34

(continued)

DRG	Number of discharges	Coefficient of variation
235	4,413	97.95
440	2,529	97.53
433	1,718	97.53
274	4,580	97.40
295	2,086	97.31
92	9,226	96.88
72	762	96.83
331	22,924	96.69
31	7,039	96.68
205	15,685	96.55
280	20,992	96.53
22	12,196	96.18
13	4,555	96.15
426	17,941	95.76
319	578	95.75
463	8,689	95.68
19	3,835	95.19
246	2,846	95.11
176	8,895	95.00
432	787	94.85
66	9,628	94.79
154	30,188	94.78
200	1,567	94.63
369	3,985	94.35
240	14,285	94.13
464	4,564	93.96
413	14,462	93.85
179	5,285	93.73
152	7,595	93.59
318	7,730	93.52
292	3,342	93.47
435	651	93.38
253	26,602	93.35
411	1,307	93.34
236	30,529	93.21
338	7,114	93.15
82	70,335	93.15
204	22,666	93.13
73	7,698	93.05
80	1,706	92.85
245	2,827	92.82

(continued)

DRG	Number of discharges	Coefficient of variation
88	124,425	92.75
398	8,023	92.63
189	4,931	92.59
173	1,812	92.52
206	1,934	92.52
170	8,437	92.52
346	13,439	92.44
418	6,667	92.28
180	49,813	92.24
287	3,957	92.12
317	621	91.97
308	8,208	91.79
99	34,077	91.60
79	47,189	91.52
450	5,020	91.45
202	11,811	91.43
323	20,302	91.37
283	7,688	91.37
383	261	91.17
14	222,641	91.07
395	61,502	90.98
348	11,318	90.86
247	11,967	90.59
296	151,379	90.55
134	35,989	90.38
401	4,613	90.02

Data Tables

Table II.1: Relationship Between GAO Index and CMI for Hospitals With GAO Index Greater Than 1.05

	Wide-variation DRGs		Moderate-variation DRGs		Low-variation DRGs	
GAO index > CMI (difference)	**Number of hospitals**	**Percent of group**	**Number of hospitals**	**Percent of group**	**Number of hospitals**	**Percent of group**
less than -.04	7	1.2	5	0.8	1	0.2
-.04 to .04	482	79.9	605	97.7	530	99.4
.05 to .09	86	14.3	7	1.1	2	0.4
.10 to .19	26	4.3	2	0.3	0	0.0
.20 to .29	0	0.0	0	0.0	0	0.0
.30 to .39	2	0.3	0	0.0	0	0.0
Total	**603**	**100.0**	**619**	**100.0**	**533**	**100.0**

Source: GAO analysis of fiscal year 1985 Patient Bill File

Table II.2: Relationship Between GAO Index and CMI for Hospitals With GAO Index Less Than 0.95

	Wide-variation DRGs		Moderate-variation DRGs		Low-variation DRGs	
CMI > GAO index (difference)	**Number of hospitals**	**Percent of group**	**Number of hospitals**	**Percent of group**	**Number of hospitals**	**Percent of group**
less than -.04	15	0.7	7	0.3	30	0.8
-.04 to .04	1,938	88.0	2,372	98.8	3,691	98.2
.05 to .09	208	9.5	14	0.6	38	1.0
.10 to .19	18	0.8	4	0.2	1	0.0
.20 to .29	5	0.2	3	0.1	0	0.0
.30 to .39	9	0.4	1	0.0	0	0.0
.40 to .49	5	0.2	0	0.0	0	0.0
.50 to .59	1	0.1	0	0.0	0	0.0
.60 to .69	3	0.1	0	0.0	0	0.0
Total	**2,202**	**100.0**	**2,401**	**100.0**	**3,760**	**100.0**

Source: GAO analysis of fiscal year 1985 Patient Bill File

Table II.3: Range of GAO Indexes by Hospital Location and Bed Size

Location	Bed size	Total in data base	Number with GAO indexes from 0.40970 to 0.94994	Percent of total	Number with GAO indexes from 1.05001 to 1.49221	Percent of total
Urban	1 to 99	591	310	52.5	68	11.5
Urban	100 to 404	1,369	227	16.6	281	20.5
Urban	405 to 684	365	17	4.7	115	31.5
Urban	685 or more	79	2	2.5	32	40.5
Rural	1 to 99	1,964	1,404	71.5	68	3.5
Rural	100 to 169	382	179	46.9	19	5.0
Rural	170 or more	222	63	28.4	19	8.6
Total		**4,972[a]**	**2,202**		**602[a]**	

[a]The location and bed size of one of the hospitals in our data base was unknown.

Source: GAO analysis of fiscal year 1985 Patient Bill File.

Examples of Major Changes to the DRG Classification System (Fiscal Years 1985-87)

Changes	Prior DRG	New DRG
Created new DRGs:		
1 Created DRG 471 for bilateral joint procedures--codes 8141 8148. 8151. 8159. 8161 thru 8164	209	471
2 Created DRG 472 to include extensive burns with operating room procedures	457	472
3 Created DRG 473 for acute leukemia cases without major operating room procedures	401 thru 405	473
Restructured DRGs:		
4 Restructured DRGs 353 thru 355, 357 thru 362 to correct hierarchy (surgical) and logic problems	353–355 357–362	None
5 Restructured DRGs 434 thru 438 to better reflect substance dependence and detoxification and rehabilitation treatment	434 thru 438	None
6 Restructured leukemia and lymphoma DRGs 401 thru 405 by eliminating age as a criterion and by distinguishing between acute and nonacute cases	401 thru 405	None
7 Restructured DRGs 223 and 224 to reduce the variability in operating room procedures for the upper extremities	223–224	None
8 Redefined DRGs 228 and 229	228–229	None
9 Shifted diagnosis code 7241 (pain in thoracic spine) from DRG 247 to DRG 243	247	243
10 Grouped all operating room procedures involving the use of a heart pump into DRG 108	108, 109, 110 thru 112	108
11 Shifted procedure code 360 (removal of coronary artery obstruction) from DRG 108 to DRG 112 (percutaneous transluminal coronary angioplasty)	108	112
12 Shifted diagnosis codes 1946, 2276, and 2373 from MDC 10 DRGs to DRGs 10 and 11	Multiple	10 and 11
13 Shifted procedure codes 5051 and 5059 from DRGs 442 and 443 to DRG 468	442 and 443	468
14 Shifted procedure code 5494 from DRG 201 to DRG 191	201	191
15 Shifted diagnosis code 7248 from DRG 247 to DRG 243	247	243
16 Shifted procedure code 7491 to DRG 381	375	381
17 Shifted diagnosis code 2281 to DRGs 398 and 399 from MDC 5 DRGs	Multiple	398 and 399
18 Changed surgical hierarchy so that procedure codes 1291, 1292 1471 thru 1475, and 1479, when performed in combination with a lens procedure, are assigned to DRG 39	42	39
19 Shifted newborns transferred to other than acute care facility from DRG 385 to DRG 386 thru 391	385	386 thru 391
20 Shifted procedures for leg amputations or any amputation of the lower extremity for circulatory disorders other than toe from DRG 114 to DRG 113	114	113

(continued)

Changes	Prior DRG	New DRG
21 Shifted patients who have an open breast biopsy that also undergo a unilateral simple mastectomy but who do not have a principal diagnosis of malignancy, from DRG 262 to DRG 261	262	261
22 Shifted congenital anomaly diagnosis codes 7583, 7584, 7585, and 7586 in MDC 15 DRGs to DRGs 352, 369, 429, and 467	Multiple	352 369 429 467
23 Shifted diabetes diagnosis codes 25040 and 25041 from DRGs 294 and 295 to DRGs 331 thru 333	294 and 295	331 thru 333
24 Shifted diabetes codes 25060 and 25061 from DRGs 294 and 295 to DRGs 18 and 19, and codes 25070 and 25071 to DRGs 130 and 131	294 295	18 19 130 131
25 Shifted any MDC 17 case with a surgical procedure to DRGs 400 thru 402 and 406 thru 408	403 thru 405, 409 thru 414	400 thru 402, 406 thru 408
26 Shifted all cases with a principal diagnosis of urinary stones that were treated with extracorporeal shock wave lithotripsy and no operating room procedure from DRG 324 to DRG 323 regardless of age and/or comorbidity	324	323
27 Shifted 257 procedure codes from DRG 468 to the MDC of the patient's principal diagnosis	468	Multiple

Appendix IV

Comments From the Department of Health and Human Services

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of Inspector General

Washington, D.C. 20201

FEB 17 1988

Mr. Richard L. Fogel
Assistant Comptroller General
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Fogel:

The Secretary asked that I respond to your request for the Department's comments on your draft report, "Medicare: Refinement of Diagnosis Related Groups Needed to Insure Payment Equity." The enclosed comments represent the tentative position of the Department and are subject to reevaluation when the final version of this report is received.

We appreciate the opportunity to comment on this draft report before its publication.

Sincerely yours,

Richard P. Kusserow
Inspector General

Enclosure

Comments of the Department of Health and Human Services on the General Accounting Office Draft Report, "Refinement of Diagnosis Related Groups Needed to Insure Payment Equity"

Overview

Because of the importance of diagnosis related groups (DRGs) to the prospective payment system (PPS), GAO evaluated the DRG case classification system as a means of grouping patients for payment purposes. Specifically, GAO's objectives were to (1) measure the variations in the level of resources required to treat patients within the DRGs, (2) determine if hospitals get an equal mix of high and low-cost patients in DRGs where wide variation in resource requirements does exist, and (3) determine if hospital characteristics such as bed size and rural or urban location help determine whether a hospital receives patients with higher or lower than average treatment costs within the DRGs.

Basically, GAO found that one of the primary concepts behind PPS (that DRGs group patients whose treatment is expected to use about the same amount of hospital resources) was not being achieved. Rather, the variation of expected treatment costs for the diagnoses and procedures falling under particular DRGs was high. In addition, high and low expected treatment cost cases were not evenly distributed among hospitals. In view of these findings, GAO is recommending that the Health Care Financing Administration (HCFA) review those DRGs GAO identified as having wide variation in patient resource requirements and change the DRG classification system to reduce the variation within these DRGs.

GAO Recommendation

That the Secretary of HHS direct the Administrator of HCFA to review those DRGs that we have identified as having wide variation in patient resource requirements and change the DRG classification system to reduce the variation within these DRGs.

Department Comment

Section 1886(d)(4)(C) of the Social Security Act already requires that we adjust the DRG classifications and weighting factors annually to reflect changes in treatment patterns, technology and other factors that may affect relative resource use. Because the very establishment of DRGs rests on the assumption that clinically similar discharges should require similar resources, we have only proposed such DRG classification changes as would reduce resource variation within groups.

Page 2

In light of the foregoing, we believe that we are already meeting the spirit of GAO's recommendation. We are concerned, however, that readers of the GAO report will expect greater improvements in the distribution of payments across hospitals by refining the DRGs further along the lines suggested by GAO's analysis. Specifically, the sheer volume of discrete categories implied by grouping cases on the basis of the individual diagnoses and/or procedures that are currently classified together would produce a system that would be unmanageable, as there are literally thousands of diagnosis and procedure codes. GAO neither reports how many categories were created for purposes of establishing the GAO index nor displays the degree of variance reduction achieved by disaggregating the current DRGs into finer categories. Indeed, it is not even clear whether GAO's analysis takes into account the extent to which classification changes implemented since 1985 (the year from which the data for GAO's analysis was derived), especially elimination of age over 69 as a factor in DRG assignment and refinement of the complications/comorbidities list, might have already narrowed the difference between the GAO index and the case-mix index for wide-variation DRGs. Although GAO has found a relationship between urban/rural location and hospital size and the percentage of hospitals with higher- or lower-than-average expected costs, GAO never simulates actual payments or compares actual payments or actual costs of hospitals to the expected costs. The fact that large urban hospitals have higher-than-average expected costs in wide-variation DRGs does not mean that they are underpaid for those cases, as there are separate urban and rural payment rates. The payment rate differential, never accounted for in GAO's analysis, would mitigate in large part what GAO characterizes as payment inequities, as evidenced by the fact that in the first 3 years of PPS, urban hospitals were much more likely than rural hospitals to have positive Medicare operating margins and, on average, had higher margins than rural hospitals. Special payment adjustments, the indirect costs of medical education and a disproportionately low-income patient load also provide mostly urban hospitals with additional relief from their costlier case loads.

See comment 1
See comment 2
See comment 3

See comment 4

In addition to the rate distinction for urban/rural hospital locations, PPS has also been designed to distinguish and provide an additional payment for extremely long and/or costly (outlier) cases. The outlier payment is for the purpose of protecting the hospital from extreme losses on individual cases, and also to protect patients from possible discrimination on the basis of characteristics that might identify them as being more likely to have long and/or costly stays.

Page 3

See comment 5

We would note that HCFA research in the "PPS Impact Report to Congress" series has closely scrutinized the impact of PPS on the most likely groups of patients to be "high" cost, and hence potentially subject to discrimination; i.e. the oldest old, ESRD beneficiaries and minorities. Our research has found no evidence that these groups have suffered discrimination or inadequate access to hospital care. That is not to say that we do not recognize the need for continuous examination of the payment system. We are continually reviewing the DRG categories to deal with any problems in classification and to avoid incentives to discriminate against types of patients who represent higher risks because they are misclassified or because the predominate method of treatment changes. In addition, research is progressing toward the development of measures that may be used to refine the DRG system by accounting for the level of severity (as reflected in resource requirements) of groups of patients within DRGs. We are also developing a revised outlier payment policy that will better address the risk presented by extremely costly patients.

These ongoing activities are designed to meet the need for improvement in the current payment system. Additional activities are, we believe, unnecessary.

The following are GAO's comments on the specific points made by the Department of Health and Human Services in its letter dated February 17, 1988.

GAO Comments

1. HHS commented that the sheer volume of discrete categories implied by grouping cases on the basis of the individual diagnoses/procedures that are currently classified together would produce a system that would be unmanageable because there are thousands of diagnoses and procedures. HHS also stated that we did not show the degree of variance reduction achieved.

As stated on page 32, we grouped cases on the basis of individual diagnoses/procedures for analysis purposes only—that is, to get a more precise measure of each hospital's expected average cost of treating patients within each DRG. We stated that we were not implying that this method of grouping patients be used for payment purposes. As discussed on page 33, HHS has created separate DRGS for specific diagnoses/procedures in the past to reduce resource variation in the DRG case classification system, and there may be some instances within the 148 wide-variation DRGS where this would be warranted. However, we are not recommending that each of the thousands of diagnoses/procedures be a discrete grouping for paying hospitals under PPS. The degree of variance reduction achieved would depend on how many DRGS were revised and how they were revised. The data we developed indicate intra-DRG resource variation was not a severe problem in about two-thirds of the DRGS reviewed. Thus, we concluded that overall, the DRG case classification system provides a good basis for determining hospital payments under PPS.

2. HHS stated that it is not clear whether our analysis takes into account the extent to which classification changes implemented since 1985 (the year from which the data for our analysis was derived) might have already narrowed the difference between the GAO index and the case-mix index for wide-variation DRGS, especially elimination of age over 69 as a factor in DRG assignment and refinement of the complication/comorbidities list.

Our analysis of the variation in treatment costs within the DRGS was based on the most current data available at the time. We acknowledged on page 35 that some of the wide-variation DRGS we identified in our analysis were affected by the changes discussed in the HHS comments, and the restructuring may have reduced their variation. To the extent

that variation in certain DRGs has already been reduced, further refinement of those DRGs might not be necessary.

3. HHS commented that our analysis did not consider hospital actual costs and actual payments and that the higher payment rate for urban hospitals and special payment adjustments would mitigate the payment inequities discussed in the report.

We do not believe that a comparison of hospital actual costs and actual payments is relevant to our analysis or conclusions. As discussed on pages 19-20, HCFA officials and other researchers point out that the critical question in evaluating the fairness of the DRG classification system is whether certain hospitals consistently treat patients whose average treatment costs are significantly higher or lower than the national average for a given DRG. Thus, the important factor to consider in answering this question is a hospital's average cost per DRG relative to the national average treatment cost for all patients in the DRG. However, using hospital actual costs in such an analysis of the DRG classification system would distort the results because of the varying levels of hospital efficiency, varying physician practice patterns across the country, differing wage levels, and cost differences between teaching and nonteaching hospitals. For this reason, we used hospital "expected average cost" per DRG rather than hospital "actual average cost" per DRG. These expected costs are based on national average costs for each diagnosis/procedure within the DRGs, and thus we use essentially the same methodology for determining the average level of efficiency as is used in setting the DRG weights. Further, as stated on page 21, before computing the national average diagnosis/procedure costs, we standardized all bill costs to remove the effects of wage level differences and teaching intensity.

Similarly, looking at the total payments a hospital receives under PPS can conceal inaccuracies in the method for determining these payments. As discussed on page 10, the basic PPS payment that a hospital receives is determined by multiplying two factors—the hospital's "standard payment amount" and the DRG "weight." The standard amount for urban hospitals is adjusted upward to reflect the higher wage rates and input prices paid in urban areas. However, the intra-DRG variation discussed in this report is related to the DRG weight, not the standard amount. Thus, an equitable standard amount multiplied by an inaccurate DRG weight can still result in an inequitable PPS payment. Likewise, giving hospitals add-ons to the basic PPS payment for the additional cost they incur in providing graduate medical education and serving a disproportionate share of low-income patients does not change the need to make the basic

PPS payment as equitable as possible. If such add-ons, which are designed to compensate hospitals for factors unrelated to intra-DRG variations, do result in adequate compensation for the wide-variation DRGS, it would be a matter of chance and not of design. In fact, a more accurate DRG classification system may help reduce the number of special adjustments that are needed and would improve the accuracy of those adjustments that are used.

4. HHS commented that in addition to the rate distinction for urban/rural hospital locations, PPS has also been designed to distinguish and provide an additional payment for extremely long and/or costly (outlier) cases. The outlier payment is for the purpose of protecting the hospital from extreme losses on individual cases, and also to protect patients from possible discrimination on the basis of characteristics that might identify them as being more likely to have long and/or costly stays.

As stated on page 12, we excluded all outlier cases from our analysis. Thus, the consistently higher-than-average treatment costs that we identified at some hospitals are exclusive of outlier cases, and the hospitals would receive no outlier payments to offset the higher costs that we discuss.

5. HHS commented that research is progressing toward the development of measures that may be used to refine the DRG system by accounting for the level of severity (as reflected in resource requirements) of groups of patients within DRGS. HHS said it is also developing a revised outlier payment policy that will better address the risk presented by extremely costly patients.

These activities are commendable, but neither directly addresses the problem of intra-DRG variation in treatment costs discussed in this report. As HHS stated, severity-of-illness refinements to the DRG system at some point may allow payment distinctions for patients who, for example, have the same diagnosis within a DRG but who have differing treatment resource requirements because of differing levels of severity. However, based on the results of major studies on this issue, severity-of-illness refinements to the DRG system do not appear likely in the near future. In the interim—and as a prerequisite to implementing severity refinements—we believe every effort should be made to ensure that the DRG groupings are correct. That is, the intra-DRG variation that currently exists should be reduced, and a good starting point in this effort is the 148 wide-variation DRGS we have identified.

*U.S. G.P.O.

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